

REMARKS/ARGUMENTS

Reconsideration and withdrawal of the outstanding grounds of rejection are respectfully requested in light of the above amendments and the remarks which follow.

The Examiner has rejected claims 1, 2, 4-9 and 23 under 35 U.S.C. 103(a) as unpatentable over Ritter '816 in view of Japan '901 or Glezer '397. According to the Examiner, Japan '901 teaches the utilization of concavities on turbine component surfaces in the same region as Ritter in order to enhance the cooling effectiveness. Glezer is cited for teaching the utilization of concavities arranged in staggered rows on turbine component surfaces in order to enhance coolant effectiveness, and with certain dimensional aspects within the claimed ranges. The Examiner concludes that it would have been obvious to utilize concavities with the dimensions disclosed in either Japan or Glezer in Ritter. With regard to dependent claim 2, the Examiner takes the position that it would have been obvious to employ surface concavities on either or both the inner and outer walls of the cooling passage of Ritter.

Applicant has amended independent claim 1 to incorporate the limitations of dependent claims 2 and 8. At the same time, dependent claims 2 and 7-9 have been cancelled. As amended, independent claim 1 requires that both the radially inner and outer surfaces be formed with an array of concavities, each having a diameter D with center-to-center distance between adjacent concavities equal to about $1.1-2D$; with a ratio of channel height concavity diameter in the range of 0.25-5.

None of the references cited by the Examiner, alone or in combination, suggest the required structure and dimensional requirements of claim 1 as amended. In this regard, the Examiner acknowledges the failure of the prior art to disclose or suggest the limitation requiring both inner and outer surfaces of the channel to have the array of concavities, but nevertheless contends that it would have been obvious to employ surface concavities on either or both the inner and outer walls as taught by JP '901 and optionally Glezer et al.

A careful review of JP '901 and Glezer et al. turns up no disclosure or even remote suggestion that both the inner and outer surfaces of the cooling channels be formed with an array of concavities as claimed. In fact, in each of the three references cited by the Examiner, concavities are provided on only one of the two interior surfaces of the cooling channel. Further in this regard, the Examiner seemingly relies upon Ritter as teaching passages that are not limited to simple axial passages but more complicated enhanced cooling geometries as disclosed in column 4, lines 37-40. This portion of the Ritter disclosure, however, suggests only a single alternative structure, i.e., where a circumferential cross flow passage as shown in Figure 7, extends transversely of the axially extending cooling channels. The reference suggests nothing with respect to the incorporation of concavities on both the radially inner and outer surfaces of the axially extending cooling channels. For these reasons, the applied prior art fails to disclose or suggest the subject matter of amended independent claim 1 and, necessarily, of remaining dependent claims 4-6 and 23.

The Examiner has also rejected claims 1-9, 11-17 and 22-24 under 35 U.S.C. 103 as unpatentable over Ritter '816, Japan '901 or Glezer '397, and further in view of Ritter '853.

The ground of rejection here is similar to that discussed above, but with the addition of Ritter '853. However, there is no disclosure or teaching in Ritter '853 to incorporate concavities on both the radially inner and outer surfaces of an axially extending cooling channel. In other words, the additional reliance on Ritter '853 does nothing to remedy the deficiencies of the base combination of references as discussed hereinabove.

It is further noted that independent claim 12 also requires that both the radially inner and outer surfaces be formed with an array of concavities along with other dimensional limitations relating to aspect ratio, channel height to concavity diameter ratio, and center-to-center distance between concavities. Since the prior art cited and applied by the Examiner fails to disclose or suggest the claimed combination of features, the rejection of independent claim 12 as well as remaining dependent claims 13-15, 23 and 24 is improper and should now be withdrawn.

The Examiner has also rejected claims 1-9, 11-17 and 22-24 under 35 U.S.C. 103 as unpatentable over Ritter '853 in view of Japan 2001-164901, and, alternatively, Glezer et al. As noted above, both independent claims 1 and 12 require that both the radially inner and outer surfaces of the cooling passage be provided with concavities along with other dimensional relationships. The rearranged combination of references remains

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deficient for all of the reasons presented hereinabove. Accordingly, it is respectfully submitted that all of the remaining claims (1, 3, 4-6, 11-15, 23 and 24) are in condition for immediate allowance and early passage to issue is requested. Since the claims are in condition for allowance, or at the very least place the application in better condition for appeal by consolidating the claims, entry of the amendment is fully consistent with 37 CFR 1.116(b).

In the event any small matters remain outstanding, the Examiner is encouraged to telephone the undersigned so that the prosecution of this application can be expeditiously concluded.

Respectfully submitted,

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